Additional Common Responses:

Attached are copies of CR14 which was not complete when the package was sent to the print shop and CR5 which had some additional changes made after it was delivered for printing.

Please remove/ignore the CR5 in the printed set and use this copy.

CR 14 CALFED's Water Quality Program Will Not Improve Drinking or Ecosystem Water Quality

This response is to the general comments about water quality issues as part of the CALFED-Bay Delta Program, most of which focused on the need for good quality water for either drinking water, agricultural water, or ecosystem water. Many comments urged CALFED to improve the water quality program to benefit ecosystem and drinking water quality. Other comments presented either support or opposition to the idea of the CALFED Program helping to develop or strengthen water quality standards; in association with these comments is the subtopic of how water quality could affect any decision as to whether or not storage proposals would go forward. The third major theme of these comments dealt with the concern that CALFED participate in controlling water pollution at its source. Improving water quality is one of the fundamental goals of the CALFED Program.

CALFED is committed to ~~achieving continuous improvement in~~ improving the water quality of the San Francisco Bay-Delta estuary. The Program's goal are twofold: (1) minimizing ecological, drinking water, and other water quality problems and (2) maintaining higher water quality once it is achieved. This objective extends to the watersheds that flow into the estuary to the extent that water quality problems in these watersheds affect beneficial uses dependent on the estuary. ("Continuous" in this sense means a steady or step-wise trend over the 30-year period of the Program, and does not include short-term fluctuations that may be brought about by varying hydrologic conditions, or other such temporary events.) Appendix C of the Water Quality Program Plan lists specific water quality targets to gauge its success; however, the Program will seek to achieve water quality that exceeds these targets where feasible and cost effective. At the same time, it is anticipated that periodic re-evaluation of water quality targets will be a feature of adaptive management within this strategy.

Successfully meeting the water quality objective, outlined in the Water Quality Program Plan, depends upon close coordination and collaboration among the Program, responsible State and Federal agencies, and local agencies and interests. The Program will emphasize voluntary, cooperative, incentive-based efforts to improve water quality, but the Program also will work with regulatory agencies to assure program goals are accomplished where voluntary efforts prove insufficient.

CR 14.1 Environmental Water Quality Improvement Strategy. CALFED's environmental water quality goal is to provide water in the San Francisco Bay-Delta of sufficient quality to protect all ecological beneficial uses of the water. For many water quality parameters, numerical or narrative objectives exist in water quality control plans adopted by the SWRCB and Regional Water Quality Control Boards. CALFED will use these objectives where appropriate as its targets for water quality improvement.

Water quality improvement is a key element of the ecosystem restoration strategy. Several water

quality constituents in the Delta are at levels that could cause chronic or acute toxicity to aquatic and terrestrial organisms. Toxicity testing in the Delta and its two main tributaries, the San Joaquin River and the Sacramento River, show that Bay-Delta water is frequently toxic to some test species. Since State and federal agencies already are required to compile a list of water bodies that do not meet specific water quality standards, the Program used that list to develop a portion of the Water Quality Program's scope. More detailed information about this can be found in the Water Quality Program Plan.

CALFED has identified several constituents of concern for which individual actions and studies have been proposed. Similar to the drinking water quality improvement strategy, (discussed below), the individual strategies for the environmental constituents of concern contain actions such as source reduction and mine remediation. The studies proposed include source identification, interaction with the environment, and bioavailability. Each strategy is composed of a combination of actions and studies that will be developed and performed under the scrutiny of a public advisory group. Both the studies and actions must be conducted with continuous monitoring and assessment. The major areas that have been identified for action and the basic programmatic actions are:

- Low Dissolved Oxygen and Oxygen-Depleting Substances (in the lower San
- Joaquin River, South Delta, and elsewhere) -
- Mercury (the Sacramento River, Cache Creek, the Delta, and the Bay) -
- Pesticides (from urban and agricultural uses of current pesticides)
- Organochlorine compounds~ (compounds like DDT and PCBs)
- Salinity (concentrated mostly in the San Joaquin Valley)
- Selenium (a naturally occurring salt in the San Joaquin Valley that gets concentrated in agricultural drainage, and a component of Suisun and San
- Pablo Bay petroleum refinery discharges)
- Trace Metals (from mines, agriculture, and urban areas)
- Turbidity and Sedimentation (predominantly in the upper watershed)
- Toxicity of Unknown Origin (predominantly in the Delta)

CR 14.2 Drinking Water Quality Improvement Strategy. The CALFED drinking water quality objective is to continuously improve source water quality that allows for municipal water suppliers to deliver safe, reliable, and affordable drinking water that meets and where feasible, exceeds, applicable drinking water standards. The CALFED strategy for improving drinking water quality is to reduce the loads or impacts of bromide and other constituents of concern through a combination of measures including source reduction, alternative water sources, treatment, and storage and conveyance improvements. Specific drinking water quality targets can be found in Section 3.4 of the Revised Phase II Report as well as Chapter 3 of the Water Quality Program Plan.

Drinking water supplies from the Delta contain higher bromide concentrations than are found in the drinking water supplies of about 90% of the nation. Bromide reacts with disinfection

chemicals to form harmful chemical byproducts that have increasingly raised health concerns for consumers. Most of this bromide comes from the ocean as a result of its connection with the Sacramento-San Joaquin Bay-Delta estuary. Additional constituents of concern for drinking water include organic carbon, which also contribute to the formation of disinfection byproducts, pathogens, nutrients, total dissolved solids (TDS), salinity, and turbidity.

CALFED's specific target for providing safe, reliable, and affordable drinking water in a cost effective way is to achieve either: a) average concentrations at Clifton Court Forebay and other south and central Delta drinking water intakes of 50 ug/L bromide and 3.0 mg/L total organic carbon; orb) an equivalent level of public health protection using a cost effective combination of alternative source waters, source control, and treatment technologies. CALFED has not adopted a specific numeric target for salinity (other than meeting existing Delta standards) but does have a preliminary objective of reducing the salinity of Delta supplies. The drinking water quality improvement strategy is composed of a combination of actions and studies developed and performed under the scrutiny of a public advisory group (the Delta Drinking Water Council, comprised of urban water agency, environmental group, business, Delta, and public health agency representatives). Interim milestones ~~will~~ may be developed in consultation with the Delta Drinking Water Council to help measure progress toward CALFED's public health protection objectives. The actions and studies to be performed as components of the strategy are:

- Source Control
- Conveyance Improvements
- Storage and Operations
- Monitoring and Assessment
- Studies
- Treatment
- Health Effects
- Alternative Sources
- Conveyance
- Storage and Operations
- Monitoring and Assessment

CR 14.3 CALFED's Role in Setting Water Quality Standards. The Water Quality Program requires substantial efforts to coordinate actions among agencies and stakeholders in order to maintain linkages with other CALFED resource areas and Program elements, and with other related programs, in order to achieve the Water Quality Program goals and objectives. Therefore, CALFED's role in setting water quality standards would be more one of coordination and facilitation among the various agencies and stakeholders whose primary concern is improving water quality. State and federal agencies with water quality jurisdiction, as well as local agencies, would continue to be responsible for ~~direct implementation of~~ establishing and achieving water quality standards ~~actions~~. For example, the State Water Resources Control Board establishes Bay-Delta water quality salinity standards and will continue to do so regardless of CALFED water quality program implementation. Success in achieving the CALFED water quality

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objectives will depend on close coordination and collaboration among agencies with jurisdiction over water quality and stakeholders with an interest in water quality. The following agencies are identified as having key roles: U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; U.S. Department of Agriculture; California Department of Food and Agriculture; California Department of Health Services; California Department of Pesticide Regulation; State Water Resources Control Board; Central Valley Regional Water Quality Control Board; and San Francisco Regional Water Quality Control Board.

Water Quality actions generally fall into four categories based on the targeted activity or source of pollution. ~~the kinds of expertise, agency involvement, and stakeholder involvement that are needed for their implementation~~. These are: mine drainage, urban and industrial sources, agricultural drainage, and sources of drinking water quality degradation. Technical teams from the WQTG will be organized in each of the Water Quality Program action categories to receive input for developing implementation plans. A Delta Drinking Water Council has been formed to advise the CALFED Program and the CALFED Policy Group through BDAC on necessary studies and actions to meet CALFED's drinking water objectives. Some actions are sufficiently developed for early implementation, while others rely on comprehensive monitoring, pilot studies, and research to improve the information needed for effective water quality management.

CR 14.3.1 What role do water quality decisions play into the decision of whether or not to go forward with storage and conveyance options. Bromide, organic carbon, and salts are constituents of major concern for drinking water, and salts are of importance to agricultural uses of Delta waters. Concentrations and loadings of these constituents will be affected by actions in the Water Quality Program and by the choice of storage and conveyance options. Section 3.7 of the Water Quality Program Plan presents an analysis of the capacity of Water Quality Program actions to affect concentrations of bromide and organic carbon in drinking water supplies taken from the Delta. Since bromide is a constituent of the total salt load, the analysis in Section 3.7 also can serve as a preliminary model for the effects of the Water Quality Program on total salt in the system.

Surface and groundwater storage along with Delta conveyance improvements can help in the management of inflows to and exports from the Delta. These improvements could be used to improve drinking water quality as well as to provide additional ecosystem protection and enhance water supply reliability. Adaptive management principles will be used to balance operations to meet these objectives. A cooperative study led by CALFED and several urban stakeholders was recently initiated to explore the potential for water quality improvements through management of water project operations. As a starting place, the group considered the potential for water quality improvements using the system flexibility provided by the Delta conveyance improvements expected during Stage 1 of implementation of the CALFED Program.

Typically, April through July are the most favorable months to use the Delta as a source of drinking water. Outflow from natural runoff is usually high enough to push seawater out of the Delta, and the period is outside the peak TOC loading from agricultural drainage. Water supply

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needs are greatest in these months because of direct demand requirements (which are supplemented by San Luis Reservoir releases). However, fishery concerns have resulted in a shift in exports from these higher water quality spring months to the lower water quality fall months, with a corresponding degradation in delivered water quality. For example, May and Joune have proven in recent years to be months in which there are elevated Delta smelt take at the export pumps. Given these special circumstances, several operational strategies could be adopted to improve water quality delivered from the Delta for drinking water, including outflow management and export management. The effectiveness of these strategies could be enhanced by constructing additional storage facilties.

- Outflow Management – Increasing Delta outflow in fall months through reservoir releases could reduce peak bromide and salinity concentrations in south Delta drinking water diversions. (Delta outflow has less of an influence on water quality at the North Bay Aqueduct's Barker Slough intake.) Preliminary modeling studies conducted by CALFED suggest that, depending on the amount of outflow enhancement and assuming some Delta conveyance improvements, peak reduction of bromide and salinity in the south Delta in fall months could be in the range of 20 to 30 percent. Such an operation would entail a water supply risk, as the filling of San Luis Reservoir would be delayed. However, the availability of conveyance improvements (i.e., South Delta Improvements and Joint Point of Diversion) along with the ability to recover some storage losses through runoff capture could significantly reduce water supply losses. With additional storage facilities north or south of the Delta, peak fall bromide concentrations could be lowered by as much as 30 to 50 percent in many years, including the driest ones.

- Export Management – Quality of delivered and stored water south of the Delta could be improved by shifting diversions to periods with better Delta water quality. When operating to meet water supply reliability and ecosystem objectives, the least risky operation is to begin filling San Luis Reservoir as soon as water and export capacity are available. This typically occurs in the fall of most years. However, if outflow has been low throughout the summer and fall months, seawater intrusion will occur in the south Delta and bromide and salinity concentrations will be elevated. If hydrologic conditions improve as the water year develops, outflows will increase and salinity will be pushed out of the Delta. Under these hydrologic conditions, it would be beneficial to postpone exports to fill San Luis Reservoir until Delta water quality has improved. However, there is no guarantee that fish conditions will be favorable and that surplus water will be available in the Delta for export.

Conveyance improvements such as South Delta Improvements and Joint Point of Diversion could offset the risk associated with selectively filling San Luis Reservoir. Additional storage south of the Delta could also offset the risk associated with selectively filling San Luis Reservoir. Preliminary modeling studies conducted by CALFED suggest that the most efficient role of additional south of Delta storage for drinking water quality purposes would be to make releases for direct delivery when foregone exports in the Delta are not recovered later in the winter. Filling of south of Delta storage

would be restricted to the periods when conveyance and pumping capacity were available and water quality in the Delta was relatively good. These conditions would likely overlap in the late winter and spring.

While the preceding discussion has focused on export management for bromide and salinity reduction, export management strategies could also be implemented to reduce organic carbon loads in drinking water diversions. Export reductions during periods of peak organic carbon loading (typically in February and March) would benefit Delta fisheries in most years as was shown in recent CALFED Environmental Water Account gaming studies. Risk to water supply reliability would depend on which assets are available for supply recovery.

Although the effects of additional upstream storage may differ depending on its location and operations, additional upstream storage generally would increase the flexibility to provide for additional fresh-water releases and Delta inflows that will improve Delta water quality. These benefits would be most apparent in dry months and seasons when additional water would be needed to meet consumptive and environmental demands. Upstream storage releases also could benefit export water quality during dry years. ~~Additional off-aqueduct south-of-Delta storage could relieve export pressures in the south Delta, thereby avoiding some of the potential for pumping-induced water quality degradation. Storage- and nonstorage-dependent operational changes being considered by the Program could significantly extend or magnify the ranges of water quality effects of the Preferred Program Alternative, depending on existing and antecedent hydrologic conditions. Releases from storage also could augment Delta outflows when needed to control sea-water intrusion and optimize estuarine conditions for the ecosystem and dependent fish species (as indicated by the position of the X2 [isohaline] index compared to standards). X2 refers to the mean tidal distance of the 2,000 milligrams per liter (mg/L) isohaline (a line of equal salinity) upstream from the Golden Gate Bridge. (Note that although this standard is based on temporal variations in salinity, it is used to regulate flow; therefore the topic is covered in Section 5.2, "Bay-Delta Hydrodynamics and Riverine Hydraulics".~~

CR 14.4 CALFED's Role in Reducing Point Source Pollution to Drinking Water. Safe drinking water is not a fixed target. Its definition changes continually as new scientific information becomes available, as understanding of water quality and human health impacts improves, and as regulatory developments reflect new scientific findings. The CALFED drinking water improvement strategy must, therefore, be a continually evolving process to achieve the vision not only of providing drinking water that meets standards for public health protection but also of continually striving toward excellence in drinking water quality. This section identifies the initial features of this strategy, with the understanding that this constitutes only the beginning of a continuing process. Evolution of the strategy will be through the full involvement of CALFED agencies, stakeholders, and the public.

Several source water constituents create difficulties for the production of a safe drinking water supply from Delta sources. These include bromide, natural organic matter, microbial pathogens,

nutrients, total dissolved solids (TDS), salinity, and turbidity. All are naturally occurring, to one degree or another, and some are magnified by anthropogenic actions. Changes in treating drinking water and reducing sources of contaminants can improve the quality and safety of drinking water from the Delta. Future drinking water regulations may, however, require improvements beyond those that can be gained through the actions specified in the Water Quality Program Plan. The priority actions listed in the plan are those that can be implemented in the nearer term with the potential to improve water quality. The degree to which taking these actions may correct the problems is not addressed.

The reader is reminded that Water Quality Program actions are intended to be implemented irrespective of the storage and conveyance alternative selected. Actions focus on source control and prevention that should be undertaken in addition to any water quality improvements that may result from selection of storage and conveyance options. Priorities for action were identified based on the apparent potential of an action to improve water quality and its capability for nearer term implementation. ~~Assignment of priorities does not necessarily reflect the degree to which taking these actions is likely to correct the problems.~~ The perception is growing that CALFED alternatives should be decided on in a phased approach over several years. Near-term drinking water regulations ~~that pose problems for treatment~~ will be promulgated prior to implementation of storage and conveyance options and realization of associated water quality benefits (Stage 1 of the Disinfectants/Disinfection By-Product Rule was promulgated in December 1998, and Stage 2 of the regulation is targeted for May 2002). ~~However, the effective date for Stage 2 may be up to 5 years if significant construction of treatment modifications is required. Moreover, a potential Stage 3 regulation, which may require even more stringent standards, should be developed in the next century.~~

The general approach to shorter term drinking water quality improvement was to reduce loadings of constituents of concern, reduce variability of source water quality, and enhance treatment flexibility, rather than rely on source replacement with higher quality waters or relocation of intakes to attain higher quality source waters. However, these latter options were discussed and developed as appropriate. The Drinking Water Work Group developed a list of potential action items that can be implemented in the near future, which can be found in Section 3 of the Water Quality Program Plan. This is a general list and not all items will apply to each withdrawal point or to each delivery system using Delta source waters.

CR 14.5 Relationship to Other Program Elements. CALFED's strategy is founded on reducing or eliminating constituents that degrade water quality at their source. However, other components of the CALFED Program can affect water quality. Watershed activities can improve water quality in the Bay-Delta system by helping to identify and control non-point sources of pollution and identify and implement methods to control or treat contaminants in the upper watersheds. CALFED has developed a Watershed Program that has strong linkages to both the water quality improvement strategy and the ecosystem restoration strategy.

Surface and groundwater storage along with Delta conveyance improvements can help in the

management of inflows to and exports from the Delta. These improvements could be used to improve drinking water quality as well as to provide additional ecosystem protection and enhance water supply reliability. Adaptive management principles will be used to balance operations to meet these objectives. A cooperative study led by CALFED and several urban stakeholders was recently initiated to explore the potential for water quality improvements through management of water project operations. However, these water quality improvements are possible only where system flexibility is dedicated to this objective; when the water projects are operated in this manner, water supply reliability benefits of the Delta conveyance improvements can be reduced. The Integrated Storage Investigation will include more refinement and analysis of operational concepts for water quality improvement.

Water use efficiency measures can improve water quality entering the Delta by reducing some agricultural and non-agricultural discharges containing pollutants. Ecosystem restoration actions may degrade drinking water quality by increasing organic carbon loads; therefore these actions will need to be structured to minimize adverse water quality impacts while meeting the Environmental Restoration Project objectives.

Water quality can affect the ability to expand water use efficiency measures such as conservation, water recycling, and conjunctive use. These measures depend on the availability of high quality water to prevent salt damage of irrigated land or groundwater basins, prevent corrosion of industrial equipment and domestic plumbing and appliances, and to achieve blended water salinity objectives. In the event of a catastrophic levee failure in the Delta, the amount of saline water entering the system could make Delta waters unusable for many months; the saline water could also have a detrimental effect on habitat quality. Therefore, it is difficult to overestimate the importance of a successful Delta levee program to achieving and maintaining good water quality for the beneficial uses of Delta waters.

CMARP will be the primary vehicle for measuring the extent to which continuous water quality improvement is achieved. Performance will be measured by comparing ambient water quality (where appropriate) to specific water quality objectives that have been established for the parameters of concern.

For detailed information about the CALFED Water Quality program and its interrelated activities with the rest of the CALFED Program, please read the Water Quality Program Plan. Additional information about the Water Quality Program element is in the PEIS/EIR, and the Revised Phase II Report.

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